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Changes in academic aptitude and achievement test scores of pupils attending public schools in disadvantaged areas in New York City were investigated. An attempt was made to determine whether varying degrees of mobility were associated with variation in changes in test scores.

The cumulative record cards of sixth-grade pupils were examined to identify pupils who met such criteria as having entered the New York City schools for the first time in either kindergarten or first grade and having uninterrupted attendance in the regular grades of the schools. Data collected concerning the number of times each pupil had been admitted to a different school in the city made it possible to recognize mobile pupils.

Pupils living in disadvantaged areas did not show a decline in academic aptitude or reading test scores from the third to the sixth grade. Disadvantaged children who had attended a single school during the six elementary school grades showed improvement from the third to the sixth grades. Disadvantaged children who attended more than one school during the six elementary school grades, however, showed a lack of improvement. Attendance in four or more schools during the elementary grades markedly affected performance.

In many cases pupils should not have been transfered to provide better ethnic balance in a school. It would have been educationally sounder to have provided funds for the transportation of mobile pupils so they could have remained in the school which they originally entered and received an uninterrupted educational experience rather than to have increased the degree of mobility to foster other educational and social values.

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STABILITY OF ACADEMIC APTITUDE AND READING TEST SCORES OF MOBILE AND NON-MOBILE DISADVANTAGED CHILDREN

by

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The generalizations that (1) disadvantaged children obtain lower scores on tests of academic aptitude and school achievement than non-disadvantaged groups; and that (2) such scores of disadvantaged children will show a progressively greater divergence from those of their more advantaged peers as the children progress through the grades, have been amply documented in the literature. For example, Sarason and Gladwin (1958), in a comprehensive review of the literature up to that date, point out that the IQ's of "culturally marginal" children deviate far less from the normal IQ during the first two or three school years than they do later. Deutsch (1960), in contrasting the achievement test scores of Negro and white children in schools of nearly comparable social levels, found that the Negro pupils showed "proportionately decreased learning over time." The evidence in this area is apparently so conclusive that Fishman and his colleagues (1964) refer to the decline in test scores with time as "one of the most consistent findings in research with disadvantaged children."

Unfortunately, few of the early studies in this field dealt with disadvantaged children residing in urban centers. The conclusion advanced by Sarason and Gladwin is based, in large part, upon analysis of the performance of such groups as Negro children in Oklahoma and Texas, white children in the isolated "hollows" of Virginia, Mexican children in Texas and New Mexico, Indian children in the Southwest, and orphanage children. More recent studies, to be sure, are more directly concerned with urban populations. However, they tend to use a cross-sectional rather than a longitudinal approach in analyzing differences in performance of pupils at various grade-levels. Typical of such analyses is one reported by HARYOU (1964), which contrasted IQ's and achievement test scores of third and sixth grade pupils in Harlem schools. In this study, the test scores of the pupils were obtained during the same year; in effect, two different sets of pupils were compared.

Frankel and Forlano (1964), in an unpublished paper, point to the obvious difficulties that arise when an attempt is made to generalize about changes in pupil test scores when a cross-sectional approach is used. In this study, longitudinal data are presented for a stable subsample of the disadvantaged pupils involved in their analysis of variation in IQ's from third to sixth grade in the New York City schools; for the transient subsample, however, only cross-sectional subgroups at the two grade levels were considered.

The paper by Frankel and Forlano adds another dimension to the study of changes in test scores of disadvantaged children. Although high mobility or transiency is characteristic of pupils residing in disadvantaged areas, this factor has received little attention. One study of pupil transiency in the New York City schools (Hasindorf, 1963) did consider the effects of mobility upon IQ and achievement but, like most of the earlier work in the field, used a cross-sectional approach.

On the basis of the evidence currently available, one might well question the validity of the second of the two generalizations advanced above. The use of cross-sectional groups and the failure to consider the possible effects of mobility as a contributing factor are serious limitations of the research that has been reported.

THE PROBLEM

This paper reports the findings of a study in which a longitudinal approach is used to investigate changes in academic aptitude and achievement test scores of pupils attending public schools in disadvantaged areas in New York City. Moreover, an attempt is made to determine whether varying degrees of mobility are associated with variation in change in test scores. It is

hypothesized that (1) disadvantaged pupils will show a decline in IQ or achievement test score as they progress through the grades; and that (2) disadvantaged pupils showing varying degrees of mobility will show differences in amount of change of test scores as they progress through the grades.

PROCEDURE

Examination of the cumulative record cards of sixth grade pupils attending thirteen schools in disadvantaged areas in New York City made it possible to identify a group of 943 pupils who met the following criteria: (1) they had entered the New York City schools for the first time in either kindergarten or first grade; (2) they showed uninterrupted attendance in the regular grades of the New York City public schools - none of the children had left the school system and then returned to it at any time during the period and none had been enrolled in special classes (health conservation classes, hospital classes, etc.) at any time; (3) their record cards indicated that they had taken the Otis Alpha Intelligence Test at the third grade level and the Otis Beta Intelligence Test at the sixth grade level. In addition, scores on the appropriate level of the Metropolitan Reading Test given in the third and sixth grades were available for 885 of the pupils.

Data were also gathered concerning the total number of times each of the pupils had been admitted to a different public school in the city. Of the total group of 943 pupils, 395 (42.3%) had attended only one school. The record cards of the remaining pupils indicated that they had attended two or more schools during the first six school years. Indeed, one pupil had been enrolled in fifteen different elementary schools between the first and sixth grades.

The presence of such a large number of non-transient pupils in dis-advantaged areas where mobility is known to be high merits some explanation. In selecting the schools from which pupils were drawn, care was taken to include several schools located in the vicinity of low-cost housing projects. Experience has shown that families residing in such projects tend to show a lower degree of transience than non-project residents, although the socio-economic level of residents and non-residents is much the same.

For the purposes of this study, any pupil who showed more than a single admission to a New York City public school was considered a mobile pupil. Since a record was kept of the total number of admissions shown by each pupil, it was possible to identify several subgroups of pupils showing varying degrees of mobility. For each of these subgroups, mean Otis Alpha IQ's at the third grade level and mean Otis Beta IQ's at the sixth grade level were compared. In addition, a comparison was made of mean deviations of Metropolitan Reading Test scores from normal performance at the two grade levels.

THE FINDINGS

1. Change in IQ

A summary of the mean changes in IQ from third to sixth grade shown by the total group of pupils and by various subgroups with varying numbers of school admissions is presented in Table 1. In addition, the results of testing obtained mean differences in IQ for statistical significance are indicated.

Table 1

Mean Changes in IQ from Third to Sixth Grade of Pupils Having Varying Numbers of Admissions to Schools

Group	N	Mean IQ Grade 3	Mean IQ Grade 6	Diff.	SD_D	SE_D	t
Total Group	934	97.0	96.9	- 0.1	12.59	.41	.24
One Admission	395	100.8	102.4	+ 1.6	12.91	.65	2.46**
More Than One Admission	539	94.2	92.9	- 1.3	12.34	.53	2.45**
Two	298	97.6	97.5	- 0.1	12.48	.72	.14
Three	120	91.7	90.5	- 1.2	11.93	1.09	1.10
Four or More	121	88.0	84.0	- 4.0	12.41	1.13	3.54*

* Significant at .01 level
** Significant at .05 level

Virtually no change in IQ from third to sixth grade is noted for the total group of 934 pupils. However, when the total group is divided into two subgroups, a stable subgroup that had been enrolled in a single elementary school for its entire schooling and a mobile subgroup that had attended more than one elementary school during the six year period, sharp differences may be observed. In the case of the stable subgroup, a mean rise of 1.6 IQ points is obtained; in the case of the mobile subgroup, a mean drop of 1.3 IQ points is noted. In both instances, the mean difference between third and sixth grade IQ is statistically significant.

Additional insights concerning the effect of mobility upon pupil performance may be gained when the mobile pupils are further subdivided in terms of the number of times they had transferred from school to school during the six year period. In the case of pupils who had attended two schools, the mean IQ remains almost unchanged from third to sixth grade. For pupils who had attended three

elementary schools, a mean drop of 1.2 IQ points is noted from third to sixth grade. This loss is not statistically significant.

A statistically significant mean loss of 4.0 IQ points is observed, however, when the third and sixth grade IQ's of pupils who had attended four or more schools are compared. Evidently if mobility is a factor that affects the performance of disadvantaged pupils on an academic aptitude test, the pupils must show a relatively high degree of mobility before test scores are markedly affected.

2. Change in Reading Test Scores

A summary of the mean changes from third to sixth grade on the two subtests (Test II -- Word Knowledge and Test III -- Reading) of the Metropolitan Reading Test is presented in Table 2. The appropriate level of this test was administered in February in the third grade and in October in the sixth grade. Normal progress would be represented by grade scores of 3.7 and 6.1 in the third and sixth grade, respectively. Table 2 indicates the mean deviation (in months) from these grade scores at each grade level, and summarizes the results obtained when the mean differences (sixth grade minus third grade) in deviation scores are tested for statistical significance.

Table 2

Mean Change in Deviation (in Months) from Normal Reading Grade from Third to Sixth Grade of Pupils Showing Varying Numbers of Admissions to School.

Group	N	Grade 3	Grade 6	Diff.	SD_D	SE_D	t
Test I - Word Knowl. Total Group	885	- 3.4	- 2.8	+ 0.6	14.19	.40	1.25
One Admission	384	- 0.2	+ 2.8	+ 3.0	15.42	.79	3.80*
More Than One Admission	501	- 5.8	- 7.2	- 1.4	13.16	.59	2.37**
Two	285	- 3.6	- 2.9	+ 0.7	14.18	.84	.83
Three	110	- 7.8	-10.4	- 2.6	10.93	1.04	2.50**
Four or More	106	- 9.7	-15.4	- 5.7	12.43	1.21	4.71*
Test II - Reading Total Group	885	- 5.3	- 3.6	+ 1.7	14.19	.48	3.54*
One Admission	384	- 2.4	+ 1.7	+ 4.1	15.31	.78	5.26*
More Than One Admission	501	- 7.5	- 7.6	- 0.1	13.31	.59	.17
Two	285	- 4.7	- 2.9	+ 1.8	14.35	.85	2.12**
Three	110	- 9.5	-11.4	- 1.9	11.87	1.13	1.68
Four or More	106	-12.1	-16.6	- 4.5	11.71	1.14	3.95*

* Significant at .01 level
** Significant at .05 level

The changes noted in reading grade scores show much the same pattern as those noted for IQ's. The total group of disadvantaged pupils performed 3.4 months below grade level on Test I - Word Knowledge when they were tested in the third grade. On the sixth grade level, their performance was 2.8 months below grade level. The total group was 5.3 months below grade level on Test II - Reading when they were in the third grade; in the sixth grade, they were 3.6 months below grade level. Not only is there no drop in performance over the three year period, but the pupils show a slight gain in functioning relative to grade level. In the case of Test II, the gain of 1.7 months is statistically significant.

Here, too, sharp differences arise when the non-mobile subgroup (pupils who had attended a single elementary school during the six year period) is contrasted with the mobile subgroup (pupils who attended more than one school). The non-mobile subgroup shows a gain of three months relative to grade on Test I and of approximately four months relative to grade on Test II, between the third and sixth grades. Both gains are statistically significant. The mobile subgroup shows a loss of 1.4 months relative to grade on Test I and no change on Test II. The drop on Test I is statistically significant.

An analysis of the performance of subgroups showing varying degrees of mobility again uncovers an interesting pattern. Pupils who attended two schools since their first admission to elementary school show virtually no change in performance relative to grade level on Test I and a small, but statistically significant gain on Test II. Pupils who attended three elementary schools show losses of 2.6 months and 1.9 months relative to grade level on Test I and Test II, respectively. The loss on Test I is statistically significant.

Once again, the most dramatic changes are evidenced by the subgroups showing the highest degree of mobility. These pupils who had attended four or more schools during their elementary school years functioned almost a full 10 months below grade level in the third grade. On the sixth grade level, they show more than fifteen months of retardation in terms of grade level. On Test II, these pupils were 12.1 months below grade level in third grade; by the time they reach the sixth grade, their performance is 16.6 months below grade level. In both instances, the change is statistically significant. As in the situation where IQ's were considered, the indications are that pupils must show a high degree of mobility before reading test scores are markedly changed with the passage of time.

DISCUSSION

On the basis of the results presented above, it is evident that broad generalizations concerning changes with time in the test performance of disadvantaged children must be approached with caution. In the present study, a large group of disadvantaged pupils showed virtually no change in IQ and demonstrated moderate improvement in reading between the third and sixth grade. However, when mobile and non-mobile subgroups within the study population were compared, the former showed consistently poorer performance in the sixth grade than in the third grade, while the latter evidence consistently better performance. Evidently, mobility is a factor that must be considered before a blanket generalization may be advanced concerning the changes in school functioning of disadvantaged children. The generally better performance of the non-mobile pupils may be a function of their uninterrupted school experience.

It must be emphasized, however, that if mobility is a factor within the total educational situation, the degree of mobility must be rather high before it has an appreciable impact. In the present study, a significant decrease in IQ was observed only with a group of pupils who had attended four or more elementary schools. In the case of reading achievement, this group was also the only one in which significantly poorer performance was noted on both aspects of the test used to measure achievement.

It should be noted that the test scores of the mobile pupils become progressively lower, at both the third and sixth grade levels, as they show two, three, and four or more admissions to school. It would be of interest to determine to what extent the third grade pupils had shown a pattern of interrupted schooling prior to the administration of the tests in the third grade, and to what extent the sixth grade pupils had shown a similar pattern from this point until the administration of the sixth grade tests. Analysis of such data would

give some clues to the relative importance of an uninterrupted program in the first few years of school.

Viewed in the light of suggested approaches to solving the problem of school desegregation, these findings concerning the importance of uninterrupted schooling would tend to support the arguments advanced by opponents of plans that involve transfer of pupils to provide better ethnic balance in a given school. If a transfer policy is applied to a group of pupils that already has shown mobility, it would appear that transfer to still another school would be of dubious merit from the point of view of academic performance. It may very well be that it would be educationally more sound to provide funds for transportation of mobile pupils so that they might remain in the school that they originally entered in order to provide an uninterrupted educational experience, rather than to increase the degree of mobility in an attempt to foster other educational and social values.

SUMMARY AND CONCLUSIONS

In an attempt to determine the changes with time in academic aptitude and achievement test scores of disadvantaged pupils, third and sixth grade test scores obtained by 934 such pupils drawn from 16 schools in New York City were analyzed. In addition, the results obtained by subgroups showing varying numbers of admissions to school during the elementary school years were studied.

The major conclusions of the study may be summarized as follows:

1. Pupils residing in disadvantaged areas do not show a decline in academic aptitude or reading test scores from the third to the sixth grade.
2. Disadvantaged children who have attended a single school during the six elementary school grades show improvement, as measured by academic aptitude and reading test scores, from the third to the sixth grades.

(continued)

3. Disadvantaged children who have attended more than one school during the six elementary school grades show a lack of improvement or poorer performance, as measured by academic aptitude and reading test scores, from the third to the sixth grades.

4. Pupil mobility must be relatively high (pupils must have attended four or more schools during the elementary grades) before performance, as measured by academic aptitude and achievement test scores, is markedly affected.

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